

COOLING FANS

FIELD OF THE INVENTION

[0001] This invention relates to cooling fans, more specifically, it relates to a
5 cooling fan provided with a baseplate beneath the fan leaves, which is capable of
eliminating a turbulence, and accordingly a wind resistance, generated in the base
portion of the cooling fan for promoting the cooling efficiency of the inside electronic
components.

BACKGROUND OF THE INVENTION

10 [0002] As the operation speed and power of a generic desktop computer,
notebook computer, or MPU device, etc., is stepwise raised, hence cooling
efficiency becomes an issue of extreme importance.

[0003] Referring to Fig. 1, an existing cooling fan is usually composed of a
shaft assembly (B) pivotally mounted on a frame (A), in which a depression (A1)
15 having an upward and a sideward opening (B1) is centrally formed for receiving
the shaft assembly (B) which is radially and outwardly extended to form a plurality
of fan leaves (A2) and driven to rotate by an electrical device arranged in the frame
(A).

[0004] Because the mentioned cooling fan is usually a micro-fan with a small
20 momentum applied for electronic devices, thus its mechanical efficiency could be
deteriorated significantly by an incurred turbulence. As indicated by arrowheads in
Fig. 2, a clearance could be found between the frame (A) and the shaft assembly (B)
to allow the generation of turbulence that would impose an extra resistance on the
shaft assembly (B), and also reduce the negative-pressure effect and accordingly
25 the intake quantity of air to consequently result a degraded cooling effect.

SUMMARY OF THE INVENTION

[0005] The primary objective of this invention is to provide an improved cooling fan for solving the problems described above.

[0006] In order to realize the foregoing objective, this invention is to provide a cooling fan having a plurality of fan leaves with their bottom edges closely jointed with a common baseplate without any clearance to thereby prevent generation of turbulence.

[0007] The merits of this invention could be summarized as the following:

1. No turbulence will be created by closely jointing the fan leaves to the common baseplate;
2. To induce stronger negative-pressure effect is possible by using the common baseplate, so that air intake is enhanced to thus promote the cooling efficiency; and
3. Wind resistance is also reduced by using the common baseplate, therefore, a relatively low-power cooling fan could be sufficient for cooling purpose instead of a high-power one.

[0008] For more detailed information regarding advantages or features of this invention, at least an example of preferred embodiment will be fully described below with reference to the annexed drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The related drawings in connection with the detailed description of this invention to be made later are described briefly as follows, in which:

Fig. 1 is a three-dimensional view of the structure of a conventional cooling fan;

Fig. 2 is a side view showing a lateral section and an airflow-guiding path

of the conventional cooling fan;

Fig. 3 is a three-dimensional view of the structure of a cooling fan of this invention;

Fig. 4A is a side view showing a lateral section and an airflow-guiding
5 path of the cooling fan of this invention;

Fig. 4B is a top view showing the airflow-guiding path of the cooling fan of this invention;

Fig. 5 is a three-dimensional view showing another embodiment of the cooling fan of this invention; and

10 Fig. 6 is a three-dimensional view showing yet another embodiment of the cooling fan of this invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] As shown in Fig. 3, an embodiment of cooling fan of this invention is performed by mounting a fan body (1) on a base (2), in which a depression (21)
15 having at least an upward and a sideward opening is formed centrally in the primary portion of the base (2), and an electrical device for driving the fan body (1) is available.

[0011] The fan body (1) is pivotally jointed to the base (2) through a shaft assembly (11), which is extended outwardly from its circumferential surface to
20 form a plurality of fan leaves (12), in which the bottom edge of each fan leaf (12) is fixedly jointed with a common baseplate (13) formed by extending the circumferential surface of the shaft assembly (11) outwardly, and there is no clearance reserved between every fan leaf (12) and the baseplate (13).

[0012] Moreover, in order to mate with the fan body (1), the depression (21) of
25 the base (2) is configured such that the shaft assembly (11) can be driven to rotate

the fan leaves (12) synchronously to generate airflow by an electrical device arranged in the base (2).

5 [0013] When the shaft assembly (11) is driven to rotate by an electrical device of the base (2) as shown in Figs. 4A and 4B, a negative pressure is created in a space (12a) enclosed by every two neighbor leaves and the shaft assembly (11) by the driven fan leaves (12) so that the air above the fan body (1) would flow downwardly to enter the spaces (12a) to be guided by the depression (21) of the base (2) to finally flow out of the base (2) through the sideward opening. In this case, no airflow is permitted to enter the bottom portion of every fan leaf (12) for
10 generating any turbulence that could curb the descent of the airflow because there is no clearance existed between every fan leaf (12) and the baseplate (13).

[0014] Figs. 5 and 6 show more respective embodiments of this invention. In Fig. 5, each the fan leaf (12') of the fan body (1) is twisted by a specific angle to form a curved face, while in Fig. 6, each the fan leaf (12'') of the fan body (1) forms a plane
15 having a specific deflection angle, in the purpose of enhancing the sucked airflow and the output wind pressure by and from the fan body (1) and hence heightening the mechanical efficiency thereof. In addition to the efficacies mentioned, to lower the power usually required by the electrical device in the base (2) for driving the fan body (1) and heat generated is also possible.

20 [0015] In the above described, at least one preferred embodiment has been described in detail with reference to the drawings annexed, and it is apparent that numerous changes or modifications may be made without departing from the true spirit and scope thereof, as set forth in the claims below.